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REMARKS

Applicant requests reconsideration of the present application in view of the discussion that follows. The status of the claims is as follows. Claims 1-70 were originally filed. Claims 1-25 and Claims 71-97 are currently pending. Claims 26-70 were withdrawn from consideration and these claims were canceled previously without prejudice to Applicant's filing of divisional applications to what has been determined in a previous Office Action to be the separately patentable subject matter thereof. Claims 1, 20, 71, 90 and 91 have been amended herein.

The Amendment

Claim 1 was amended to incorporate the elements of Claim 20.

Claim 20 was amended to recite that the plurality of biopolymers are in the form of an array. Support therefor is in the Specification, for example, page 18, lines 8-12.

Claim 71 was amended to recite that a surface of the support comprises an array of biopolymers. Support therefor is in the Specification, for example, page 18, lines 8-12.

Claim 90 was amended to recite that the biopolymers are polynucleotides. Support therefor is in the Specification, for example, page 18, lines 8-12.

Claim 91 was amended to recite that the polynucleotides are DNA. Support therefor is in the Specification, for example, page 18, lines 8-12.

Rejections under 35 U.S.C. §103

Claims 1-25 were rejected under 35 U.S.C. 103(a) as being unpatentable over Earley, *et al.* (WO 94/08759 AI) (Earley).

Earley does not disclose or suggest at least one wall, in addition to the walls of the well of the present devices, extending from an area adjacent a top edge of the well to the top of the housing wherein the at least one wall is at least partially sloped in an area thereof adjacent the well or wherein a ledge extends from the edge to the at least one wall. As indicated on page 7, lines 10-11, and Figs. 7-8, Earley's disclosure relates only to standard ninety six well microtiter plates having a capacity of about 300 microliters. As can be seen from Fig. 8, the wells of Earley's microtiter plate do not have, nor is there any suggestion of, at least one wall extending from an area adjacent a top edge of the well to the top of the housing wherein the at least

one wall is at least partially sloped in an area thereof adjacent the well or wherein a ledge extends from the edge to the at least one wall. As a matter of fact, Earley's teaching is completely devoid of any disclosure of additional walls leading from his well.

The Office Action responds to Applicant's argument with the new contention that Earley teaches a microtiter plate with a lid or cover. When a standard microtiter plate cover is placed on the plate, continues the Office Action, it fits snugly over the plate such that the area adjacent a top edge of the wells on the periphery of the microtiter plate meets/contacts the microtiter plate cover (top portion of the housing). Therefore, concludes the Office Action, the area adjacent the top edge of the wells on the periphery of the microtiter plate contacts the microtiter plate cover or the top of the housing, and the wall is at least partially sloped in that it is vertical in contacting the cover.

Applicant respectfully disagrees with the above comments in the Office Action with regard to the present claims. As discussed in the Interview, Claims 1 and 71 recite that the at least one wall, which is in addition to the walls of the well, extends from an area adjacent a top edge of the well to a top portion of the housing. Clearly, adjacent wells of the microtiter plate do not satisfy this limitation. Earley does not disclose or suggest at least one wall extending from an area adjacent a top edge of the well to the top of the housing wherein the at least one wall is at least partially sloped in an area thereof adjacent the well or wherein a ledge extends from the edge to the at least one wall. The contention in the Office Action is that, when a cover is placed on the top of the microtiter plate, the area adjacent the top edge of the wells on the periphery of the microtiter plate contacts the microtiter plate cover or the top of the housing, and the wall is at least partially sloped in that it is vertical in contacting the cover.

The Office Action appears to be asserting that the microtiter plate cover is the top of the housing. The claims, however, recite that the well has walls and the housing comprises at least one wall extending from an area adjacent a top edge of the well to a top portion of the housing. In the argument in the Office Action, the wall that is identified to be vertical in contacting the cover appears to be the wall of the well. As such, there is no "at least one wall extending from an area adjacent a top edge of the well (which itself has walls as recited in the claims) to a top portion of the housing." Furthermore, when a lid is placed over the known microtiter plate, one

merely has a lid on top of the housing of the microtiter plate. The lid does not become part of the microtiter plate housing.

In addition, vertical orientation (and horizontal orientation) is excluded from the ordinary meaning of the word "sloped," which (according to Webster's Dictionary, *infra*) means upward or downward slant or inclination or degree of slant. Inclination means a deviation from the true vertical or horizontal, a slant or slope. See, for example, Webster's Ninth New Collegiate Dictionary, 1983, Merriam-Webster Inc., Springfield, Massachusetts (Webster's Dictionary), pages 1110 and 609 (copies of which are enclosed for the convenience of the Examiner).

If, as asserted in the Interview, additional features of the cover extend into the well when a cover is placed over the microtiter plate, Applicant submits that such additional features do not satisfy the claim limitation of a wall(s), in addition to the walls of the wells, where the wall is at least partially sloped in an area thereof adjacent the well. As indicated above, the word "sloped" excludes vertical or horizontal orientation. In any event, the point is moot since the reference does not disclose or suggest any additional features on the cover that extend into the wells.

Furthermore, a cover on the top of a microtiter plate housing does not satisfy the claim limitation that the device has at least one wall extending from an area adjacent a top edge of the well to the top of the housing wherein a ledge extends from the edge to the at least one wall. The microtiter plate housing of Earley does not have a wall in addition to the walls of the well of a housing where the wall extends from an area adjacent a top edge of the well to the top of the housing. If, as asserted in the Interview, additional features of the cover extend into the well when a cover is placed over the microtiter plate, Applicant submits that such additional features do not satisfy the claim limitation of a wall(s), distinct from the walls of the well, wherein a ledge extends from the edge of the well to the wall(s). In any event, as mentioned above, the point is moot since the reference does not disclose or suggest any additional features on the cover that extend into the wells.

The Office Action further contends that it would have been obvious to use a rectangular ledge for the plate as opposed to a circular one as such a modification is a simple optimization of the assay device and is not thought to change the device in any substantial manner. However, as can be seen from Fig. 8, the wells of Earley's microtiter plate do not have, nor is there any suggestion of, at least one wall extending from an area adjacent a top edge of the well to the top of the housing

wherein a ledge extends from the edge of the well to the at least one wall. As a matter of fact, Earley's teaching is completely devoid of any disclosure of additional walls leading from his well.

It has long been held that discovery of a problem is one consideration in determining the patentability of a claimed invention. *In re Atkinson*, 102 F.2d 882, 41 USPQ 308 (C.C.P.A. 1939); *In re Nomiya*, 509 F.2d 566, 184 USPQ 607 (C.C.P.A. 1969) As Applicant indicated in the Specification (page 26, lines 19-25, and paragraph bridging pages 23 and 24), for reactions involving biopolymers particularly in the form of an array of biopolymers, a small quantity of sample is distributed over the surface of the support to which the biopolymers are attached. Also, during reactions involving biopolymers on a support surface, it is often desired to heat the materials in contact with the surface of a support in a well. The heating of the support should be carried out in a manner that minimizes or avoids loss of liquid in the well of the device. This is particularly true where the liquid is sample, which is present in a relatively small quantity. Loss of liquid may occur by evaporation out of the device, or evaporation and condensation on the surface of the device, by wicking out of the well of the device and so forth. As one might appreciate, loss of even small quantities of the sample can be detrimental to the accuracy of an assay and can also result in waste of sample, which is already in limited quantity.

As the Office Action appreciates, the wicking problem recognized by Applicant is contrary to the expectations of one skilled in the art. The Office Action indicates that one does not put liquid in wells of a microtiter plate with the expectation that the liquid will not remain in there. Rather, continues the Office Action, one expects that liquid disposed in the well will stay there. On the contrary, Applicant has discovered that, in situations where a small volume of liquid forms a thin layer above the surface of a substrate or support, which comprises a plurality or an array of biopolymers, wicking of liquid from the well may occur. The structural features of the devices of the present invention avoid such wicking.

It is Applicant's teaching and invention to avoid wicking by various structural features of the claimed devices. Accordingly, the holding in *In re Rose* is not applicable since the present invention goes far beyond mere differences in size of an article of manufacture. The references do not teach or suggest the structural features set forth in the claims. Nor do the references teach the problem solved by the present invention.

Earley does not disclose or suggest a device as claimed in Claims 71 and 90-92 wherein a surface of the support further comprises an array of biopolymers, which are polynucleotides, DNA, proteins or peptides. The Office Action contends that, when sample with DNA is loaded into the wells of the plate, the bottom surface of the well (support) will comprise or contact DNA molecules. However, the claim language recites that the support further comprises an array of biopolymers. There is no array on the bottom surface of the well in Earley.

Earley does not disclose or suggest the device of Claim 2 or Claim 72 wherein the at least one wall is designed such that the corners thereof are radiused. There is no disclosure in Earley regarding such a device.

For the reasons set forth above, Earley does not disclose or suggest the device of Claim 3 or Claim 73 wherein the at least one wall is at least partially sloped in an area thereof adjacent the well.

For the reasons set forth above, Earley does not disclose or suggest the device of Claim 5 or Claim 75 wherein the at least one wall is sloped from the edge of the well to a top portion of the housing.

Earley does not disclose or suggest the device of Claim 6 or Claim 76 wherein a ledge extends from an edge of the well to the sloping portion of the the at least one wall.

Earley does not disclose or suggest the device of Claim 8 or Claim 78 wherein the at least one wall comprises a partially sloped portion in an area adjacent the ledge and a vertical portion extending from the partially sloped portion to a top portion of the device.

Earley does not disclose or suggest the device of Claim 9 or Claim 79 wherein the at least one wall is fully sloped from the ledge to a top portion of the housing.

Earley does not disclose or suggest the device of Claim 10 or Claim 80 wherein the ledge is rectangular in shape about the well.

Earley does not disclose or suggest the device of Claim 11 or Claim 81 wherein the ledge is circular in shape about the well.

Earley does not disclose or suggest the device of Claim 12 or Claim 82 wherein the at least one wall is a circular wall extending from the edge of the well to a top portion of the device.

Earley does not disclose or suggest the device of Claim 13 or Claim 83 wherein the at least one wall is a circular wall extending from a ledge adjacent the edge of the well to a top portion of the device.

Earley does not disclose or suggest the device of Claim 14 or Claim 84 wherein the device comprises at least two walls that are fully sloped from a ledge adjacent the edge of the well to a top portion of the device.

Earley does not disclose or suggest the device of Claim 15 or Claim 85 wherein the device comprises two opposing walls that are fully sloped from a ledge adjacent the edge of the well to the top portion of the device and two opposing walls extending vertically from the ledge to the top portion.

Earley does not disclose or suggest the device of Claim 16 or Claim 86 wherein the device comprises four walls that are fully sloped from a ledge adjacent the edge of the well to the top portion of the device.

Earley does not disclose or suggest the device of Claim 17 or Claim 87 wherein the partially sloped wall is sloped at least about 35 degrees.

Earley does not disclose or suggest the device of Claim 18 or Claim 88 wherein the at least partially sloped wall is sloped at about 30 to about 55 degrees.

Earley does not disclose or suggest the device of Claim 19 or Claim 89 wherein the ledge comprises a polished surface that prevents wicking of a liquid along the ledge.

As mentioned above, Earley does not disclose or suggest the device of Claim 20 or Claim 90 wherein a surface of the support comprises an array of biopolymers or wherein the biopolymers are polynucleotides (Claim 21 or Claim 91) or wherein the biopolymers are proteins or peptides (Claim 92).

Earley does not disclose or suggest the device of Claim 22 or Claim 93 wherein the slope of the partially sloped wall is constant.

Earley does not disclose or suggest the device of Claim 23 or Claim 94 wherein the slope of the partially sloped wall is not constant.

Earley does not disclose or suggest the device of Claim 24 or Claim 95 wherein the device comprises a single well and a cover. If, as asserted in the Office Action, the cover on the microtiter plate of Earley is the top of the housing, then the device of Earley would not further comprise a cover and, in particular, a cover on a single well.

Earley does not disclose or suggest the device of Claim 25 or Claim 96 wherein the at least one wall is designed such that any corners thereof are distant from the edge of the well by about 0.1 inch to about 1 inch.

Claims 1-25, 71-91 and 93-97 were newly rejected under 35 U.S.C. 103(a) as being unpatentable over Pedley (GB 2 197 720 A) in view of Kwasnoski, *et al.* (U.S. Patent No. 6,423,948 B!) (Kwasnoski). The disclosure of Pedley is discussed in a previous response. Kwasnoski discloses a microtiter plate system that in some embodiments includes a lid with an integral heater.

Pedley does not disclose or suggest at least one wall in addition to the wall(s) of the well, extending from an area adjacent a top edge of the well to the top of the housing wherein the at least one wall is at least partially sloped in an area thereof adjacent the well or wherein a ledge extends from the edge to the at least one wall. Pedley's teaching is completely devoid of any disclosure of additional walls leading from his well to the top of his housing.

The Office Action asserts, however, that it would have been obvious to one of ordinary skill in the art at the time of the invention to use the cover of Kwasnoski with the microtiter plate of Pedley because covers are routinely used in the art on microtiter plates to prevent loss of sample or contamination. Even if for the sake of argument one skilled in the art were motivated to make the combination of reference teachings as imagined in the Office Action, the skilled artisan would still not be in possession of the presently claimed inventions. As demonstrated above, Claims 1 and 71 recite that the well has walls and furthermore the housing has at least one wall that extends from an area adjacent a top edge of the well to the top of the housing wherein the at least one wall is at least partially sloped in an area thereof adjacent the well or wherein a ledge extends from the edge to the at least one wall. The contention in the Office Action is that, when a cover is placed on the top of the microtiter plate, the area adjacent the top edge of the wells on the periphery of the microtiter plate contacts the microtiter plate cover or the top of the housing, and the wall is at least partially sloped in that it is vertical in contacting the cover.

The Office Action is asserting that the microtiter plate cover is the top of the housing. The claims, however, recite that the well has walls and the housing comprises at least one wall extending from an area adjacent a top edge of the well to a top portion of the housing. In the argument in the Office Action, the wall that is identified to be vertical in contacting the cover appears to be the wall of the well. As

such, there is no “at least one wall extending from an area adjacent a top edge of the well (which itself has walls as recited in the claims) to a top portion of the housing.” Furthermore, when a lid is placed over the known microtiter plate, one merely has a lid on top of the housing of the microtiter plate. The lid does not become part of the microtiter plate housing. In addition, as explained above, vertical orientation is specifically excluded from the ordinary meaning of the word “sloped.”

If, as asserted in the Interview, additional features of the cover extend into the well when a cover is placed over the microtiter plate, Applicant submits, as discussed above, that such additional features do not satisfy the claim limitation of a wall(s), in addition to the walls of the wells, where the wall is at least partially sloped in an area thereof adjacent the well. As indicated above, the word “sloped” excludes vertical or horizontal orientation. In any event, the point is moot since the Kwasnoski reference does not disclose or suggest any additional features on the cover that extend into the wells.

For the reasons set forth above with regard to the rejection over Earley, each of the dependent claims as identified above is separately patentable over the combination of Pedley and Kwasnoski.

Claims 1-25, 71-91 and 93-97 were newly rejected under 35 U.S.C. 103(a) as being unpatentable over Balch (U.S. Patent No. 6,083,763) in view of Kwasnoski. The reasoning behind the rejection in the Office Action is essentially as discussed above for the rejection under Earley and under Pedley in view of Kwasnoski. For the reasons set forth above, Claims 1 and 71 and each of the dependent claims as identified above are separately patentable over the combination of Balch and Kwasnoski.

Claims 1-19, 22-25, 71-89 and 93-97 were newly rejected under 35 U.S.C. 103(a) as being unpatentable over Daniel (U.S. Patent No. 4,919,894). The reasoning behind the rejection in the Office Action is essentially as discussed above for the rejection under Earley. For the reasons set forth above with respect to the rejection over Earley, Claims 1 and 71 and each of the dependent claims as identified above are separately patentable over Daniel.

Claims 1-19, 22-25, 71-89 and 93-97 were newly rejected under 35 U.S.C. 103(a) as being unpatentable over Matkovich, *et al.* (U.S. Patent No. 4,828,386) (Matkovich) in view of Kwasnoski. The reasoning behind the rejection in the Office Action is essentially as discussed above for the rejection under Earley and under

Pedley in view of Kwasnoski. For the reasons set forth above in response to such rejection, Claims 1 and 71 and each of the dependent claims as identified above are separately patentable over the combination of Matkovich and Kwasnoski.

Claims 1-19, 22-25, 71-89 and 93-97 were newly rejected under 35 U.S.C. 103(a) as being unpatentable over Calenoff, *et al.* (U.S. Patent No. 4,844,966) in view of Kwasnoski. The reasoning behind the rejection in the Office Action is essentially as discussed above for the rejection under Earley and under Pedley in view of Kwasnoski. For the reasons set forth above in response to such rejections, Claims 1 and 71 and each of the dependent claims as identified above are separately patentable over the combination of Calenoff and Kwasnoski.

Claims 1-19, 22-25, 71-89 and 93-97 were newly rejected under 35 U.S.C. 103(a) as being unpatentable over Provonchee (U.S. Patent No. 4,701,754) in view of Kwasnoski. The reasoning behind the rejection in the Office Action is essentially as discussed above for the rejection under Earley and under Pedley in view of Kwasnoski. For the reasons set forth above in response to such rejections, Claims 1 and 71 and each of the dependent claims as identified above are separately patentable over the combination of Provonchee and Kwasnoski.

Claims 1-19, 22-25, 71-89 and 93-97 were newly rejected under 35 U.S.C. 103(a) as being unpatentable over Cassin, *et al.* (U.S. Patent No. 5,910,287)(Cassin). Cassin does not disclose or suggest a device having well(s) with wall(s) and a housing with at least one wall extending from an area adjacent a top edge of the well to the top of a housing wherein the at least one wall is at least partially sloped in an area thereof adjacent the well or wherein a ledge extends from the edge to the at least one wall. Cassin's teaching is completely devoid of any disclosure of additional walls leading from his well.

The Office Action contends that the walls of the wells of Cassin's microtiter plate may be completely vertical or may be conical. Even if for the sake of argument such a teaching were found in Cassin, one skilled in the art would still not be in possession of the presently claimed inventions. In Claims 1 and 71, the devices comprise a well having walls and a housing comprising at least one wall extending from an area adjacent a top edge of the well to a top portion of the housing, wherein the at least one wall is at least partially sloped in an area thereof adjacent the well or a ledge extends from the edge to the at least one wall. The cross-sectional shape of Cassin's wells or the alleged fact that the walls of Cassin's wells may be completely

vertical or may be conical has no informative value to the “at least one wall” of the claim language because the “at least one wall” is in addition to the walls of the wells. It is this “at least one wall” that is at least partially sloped in an area thereof adjacent the well or there is a ledge that extends from the top edge of the well to the at least one wall. Furthermore, for the reasons set forth above in response to the rejection over Earley, Claims 1 and 71 and each of the dependent claims as identified above are separately patentable over the teaching of Cassin.

Claims 1-20, 22-25, 71-90 and 92-97 were newly rejected under 35 U.S.C. 103(a) as being unpatentable over Kaufman, *et al.* (U.S. Patent No. 4,596,723) (Kaufman) in view of Kwasnoski. The Office Action contends that Kaufman discloses an immunoassay wherein antigen solutions are allowed to stand overnight in wells of polystyrene or polypropylene microtiter plates permitting adsorption of protein to the well bottom and walls. The Office Action further contends that it would have been obvious to one of ordinary skill in the art at the time of the invention to use the cover of Kwasnoski with the microtiter plate of Kaufman because covers are routinely used in the art on microtiter plates to prevent loss of sample or contamination.

The reasoning behind the above rejection in the Office Action is essentially as discussed above for the rejection under Earley and under Pedley in view of Kwasnoski. For the reasons set forth above in response to such rejections, Claims 1 and 71 and each of the dependent claims as identified above are separately patentable over the combination of Kaufman and Kwasnoski.

Summary

Most of the above references disclose or suggest nothing more than conventional multi-well microtiter plates. Some references disclose various nuances of the conventional microtiter plates but do not disclose or suggest the structural features of the devices of the present invention as discussed above with regard to each reference. None of the references discloses or suggests the problem solved by the present invention. Applicant submits that, in order for one to modify the deficient teachings of the reference to achieve the devices of the present invention, one would have to use Applicant's disclosure because the references do not teach anything relevant to the wicking problem addressed by Applicant and the structural features that avoid this problem particularly as they relate to supports comprising a plurality or an array of biopolymers.

The fact that a cover might be used with a microtiter plate does not disclose or suggest the inventions of the present claims as explained above. Claims 1 and 71 recite that the device comprises a housing and a support in a well of the housing where the support comprises a plurality or an array of biopolymers. The well has walls and the housing comprises at least one wall that extends from an area adjacent a top edge of the well to the top of the housing wherein the at least one wall is at least partially sloped in an area thereof adjacent the well or wherein a ledge extends from the edge to the at least one wall. The contention in the Office Action is that, when a cover is placed on the top of the microtiter plate, the area adjacent the top edge of the wells on the periphery of the microtiter plate contacts the microtiter plate cover or, as asserted in the Office Action, the top of the housing, and the wall is at least partially sloped in that it is vertical in contacting the cover.

The Office Action appears to be contending that the microtiter plate cover is the top of the housing. The claims, however, recite that the well has walls and the housing comprises at least one wall extending from an area adjacent a top edge of the well to a top portion of the housing. In the argument in the Office Action, the wall that is identified to be vertical in contacting the cover appears to be a wall of the well, not an additional wall as required in the claims. Furthermore, as explained above, vertical or horizontal orientation is specifically excluded from the ordinary meaning of the word "sloped." Finally, features of the cover that might fit into the wells (as suggested in the Interview) are not disclosed or suggested by the references and, more importantly, would not satisfy the claim limitations of either a sloped wall or a ledge extending from the well to the wall as discussed above.

The issue of a declaration by Applicant was raised in previous Office Actions and in the Interview. Applicant submits that the independent and dependent claims comprise structural features that are not disclosed or suggested by the references. Accordingly, Applicant believes that such a declaration is not warranted because the Office Action has not met its burden of proof that the inventions as claimed in the independent and dependent claims are rendered obvious by the disclosures of the references.

Conclusion

Claims 1-25 and 71-97 satisfy the requirements of 35 U.S.C. §103. Allowance of the above-identified patent application, if it is submitted, is in order.

In any event, Applicant respectfully requests entry of the above amendments since they narrow the number of issues and place the claims in better form for consideration on appeal.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Theodore J. Leitereg". The signature is fluid and cursive, with the first name "Theodore" and last name "Leitereg" clearly distinguishable.

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